Acta Orthop Scand 56, 96–97, 1985

Finger tendon rupture secondary to fracture of the hamate

A case report

Rupture of the flexor tendon of a finger secondary to fracture of the hook of the hamate is extremely rare; only seven previous cases have been published. We report an additional case and discuss the functional anatomy, diagnosis and treatment.

Akio Minami
Toshihiko Ogino
Masamichi Usui
Seiichi Ishii

Department of Orthopedic Surgery, Hokkaido University School of Medicine, Kita 14-Jo, Nishi 7-Chome, Kita-ku, Sapporo 060, Japan

Rupture of the flexor tendon of the finger secondary to fracture of the hook of the hamate is extremely rare; we have found only seven cases in the English and Japanese literature (Boyes et al. 1960, Clayton 1969, Crosby & Linscheid 1974, Stark et al. 1977, Egawa & Hayashibara 1982). We report an additional case.

Case report

A 53-year-old carpenter without previous major trauma to the hand noticed pain and tenderness in the hypothenar eminence after an injury in June 1979; the distal interphalangeal joint of the right little finger was slightly extended by an electric cord, after which the distal and proximal interphalangeal joints were incapable of active flexion. Gradually increasing hypesthesia in the volar aspect of his little finger was also noted. The patient first came to our clinic on June 29th, 1979. Spontaneous rupture of the flexor profundus at its insertion and congenital hypoplasia of the flexor superficialis were the preliminary diagnoses as weakness of flexion of the proximal interphalangeal joint of the little finger of his opposite left hand was also present. There was uncertainty as to whether the profundus tendon was palpable over the middle phalanx. Routine radiographs revealed no evidence of abnormality. All routine laboratory studies were within normal limits.

In July 1979, 1 month after injury, an operation was performed. The profundus tendon was ruptured and frayed for 3 cm adjacent to an irregular, old, ununited fracture of the hook of the hamate; the rough surface appeared to have caused an attritional rupture of the flexor tendon. The flexor superficialis of his little finger was also frayed and elongated adjacent to the fracture site at the hook of the hamate. The fracture fragment and sharp spicules were removed, and the rough surface of the body of the hamate at the site of non-union was smoothed. The flexor tendon was repaired by using the ulnar half slip of the flexor superficialis of the ring finger as an interposed tendon graft. The common digital nerve to the little finger was slightly swollen as it passed the fracture site. On inspection, the neuro-vascular structures in Guyon's canal appeared normal.

Three-week immobilization of his right hand using a plaster splint was followed by active and passive physiotherapy. The proximal interphalangeal joint obtained a range of motion from full extension to 85 degrees of flexion, but active motion of the distal interphalangeal joint was not obtained. In July 1980, an arthrodesis of the distal interphalangeal joint was performed in a position of 20 degrees of flexion. A year and a half later, he used his little finger without disability and had returned to his original job. However, he continued to notice slight pain and moderate hypesthesia in the volar aspect of the little finger of his right hand.

Discussion

The variety of reported cases of rupture of the finger flexor tendon associated with fracture of the hamate hook may be partly due to diffi-

culties in diagnosis of the fracture of the hook of the hamate (Milchi 1934, Torisu 1972, Bowen 1973, Nisenfield & Naviaser 1974, Cameron & Fournasier 1975, Carter et al. 1977, Bryan & Dobyns 1980). The cause of this tendon rupture is uncertain. Stark et al. (1977) suspected that some of the reported ruptures may have been caused by injection of steroids rather than by a fracture fragment. On the other hand, Carter et al. (1977) described fraying of the profundus tendon at the level of the ununited hamate fracture in two of their nine patients.

Fracture of the hook of the hamate has been classified into three types: base, corner triangle, and split (Stark et al. 1977). All cases with ruptured flexor tendon had the fracture at the base of the hook. Sharp spicules at the fracture site may induce attritional rupture of the flexor tendons in the ulnar two fingers, notably the little finger. Both the flexor superficialis and profundus of the little finger and the flexor profundus tendon of the ring finger run their course around the base of the hook of the hamate, causing these three tendons to be at greatest risk.

Steroid injections did not seem to be a factor in the etiology of our case or others reported in the literature, although the admonition of Stark et al. (1977) against this treatment for the misdiagnosis of tendinitis associated with old hamate fracture is pertinent. Spontaneous rupture of a flexor tendon may be the only symptom of an old fracture with attritional rupture, the most likely etiologic factor. Both Carter et al. (1977) and Stark et al. (1977) described the possibility of flexor tendon rupture because of chronic chafing against the rough bone edges. For this reason they felt that the fracture fragment should be removed even when no rupture had occurred. We agree with this recommendation, once the diagnosis of a fracture of the hook of the hamate is established.

References

Bowen, T. L. (1973) Injuries of the hamate bone. *Hand* **5**, 235–238.

Boyes, J. H., Wilson, J. N. & Smith, J. W. (1960) Flexor tendon ruptures in the forearm and hand. *J. Bone Joint Surg.* **42**-A, 637–646.

Bryan, R. S. & Dobyns, J. H. (1980) Fractures of the carpal bones other than lunate and navicular. *Clin. Orthop.* **149**, 107–111.

Cameron, H. U. & Fournasier, V. C. (1975) Fracture of the hook of the hamate. *J. Bone Joint Surg.* **57**-A, 276–277.

Carter, P. R., Eaton, R. G. & Littler, J. W. (1977) Ununited fracture of the hook of the hamate. *J. Bone Joint Surg.* **59**-A, 583–588.

Clayton, M. L. (1969) Rupture of the flexor tendons in carpal tunnel (non-rheumatoid) with specific reference to fracture of the hook of the hamate. *J. Bone Joint Surg.* **51**-A, 798–799.

Crosby, E. B. & Linscheid, R. L. (1974) Rupture of the flexor profundus tendon of the ring finger secondary to ancient fracture of the hook of the hamate. *J. Bone Joint Surg.* **56**-A, 1076–1078.

Egawa, T. & Hayashibara, A. (1982) Rupture of flexor profundus tendons secondary to the fracture of the hook of the hamate. (In Japanese). *Seikeigeka* **33**, 1624–1626.

Milchi, H. (1934) Fracture of the hamate bone. *J. Bone Joint Surg.* **16**, 459–462.

Nisenfield, F. G. & Naviaser, R. J. (1974) Fracture of the hook of the hamate: A diagnosis easily missed. *J. Trauma* **14**, 612–616.

Stark, H. H., Jobe, F. W., Boyes, J. H. & Ashworth, C. R. (1977) Fracture of the hook of the hamate in athletes. *J. Bone Joint Surg.* **59**-A, 575–582.

Torisu, T. (1972) Fracture of the hook of the hamate by a golf swing. *Clin. Orthop.* **83**, 91–94.